Functional Forms Discussion: Major points for the Working Group

- Importance of functional forms differ in stock rebuilding vs. tradeoff analysis from “rebuilt” resources. May not be able to discern the right hand-limb of FF relationships when data come from only part of the response domain. Need to understand the implications of Type II errors in choice of form to consequences e.g., which are “dangerous”. How do these choices influence the development of National standards (e.g., recovery of species)? Non-symmetrical decline-recovery. Frequency, low, high, episodes.

- Specificity of data may dictate complexity of models. Synthesize literature on testing, fitting and choice of FFs and models. What data are required to discern between FFs? Time series, imbedded experiments, fit to time series, examine likelihood of alternatives. Examine multiple FF, simulations of consequences, mgt. implications.

- Aggregate dimensions to reduce complexity (positives and dangers). Triage models, data and costs/benefits of complexity. Stationarity in FFs useful first approximation, but should not assume they apply in all time/biomass domains.

Functional Forms Discussion: (continued)
Major points for the Working Group

- Develop multiple causal factors in models to evaluate complex drivers. Less useful as a direct management tool as opposed to a guide. Most importance for environmental drivers is low-frequency noise. Should embrace other, non traditional approaches (e.g., bioenergetics, IBMs). Are there ways to look at semi-quantitative evaluations given FF uncertainty.

- Behavioral dynamics important to consider, spatial scale in relationships may look like predator-prey switching. Human dimensions may look like complex FFs. Mgt. measure selection (MPA, TAC) may be dependent on FFs

- Interactions of incomplete data and imprecise understandings of mechanisms – adaptive experimental approach. Indicators may be useful when model uncertainty is high.

Functional Forms Discussion: (continued)
Major points for the Working Group

- Functional responses may be endogenous to certain models
- Stakeholder involvement in model selection & adaptive approaches to discern FFs – a governance issue, can inform process. Being explicit about uncertainty is important in governance & modeling. Component of an ecosystem approach. Expressing uncertainty and sources of "error"
- Need a new language to differentiate process uncertainty from "mistakes" = error. Model complexity and uncertainty are linked and difficult to interact with management in this dialog. Different cultures of scientists, fishers & managers influence perspectives on risk. Design robust strategies if FF too uncertain and determinant. Adversarial-adaptive